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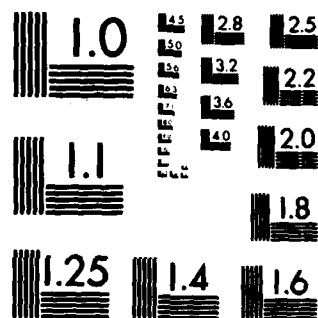
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APPLIED STATISTICS

FINAL REPORT

HERBERT SOLOMON

MARCH 18, 1980

U. S. ARMY RESEARCH OFFICE

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DEPARTMENT OF STATISTICS
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21. ABSTRACT (Continue on reverse side if necessary and identify by block number) List the titles of This reports on the 41 Interim Technical Reports issued, during Army visits undertaken, and scientific personnel involved in the research program.		

FINAL REPORT
APPLIED STATISTICS
DAAG29-77-G-0031

January 1, 1977 - December 31, 1979

As the title indicates a wide variety of topics received attention and analysis. The subjects proposed resulted from the interests of the proposed investigators and included topics whose resolution could be helpful in Army programs. This was a continuation of previous efforts along the same lines for the Army.

Over the three year period, 41 Interim Technical Reports were issued. Of these 33 have been published or been accepted for publication. The remaining eight have been submitted and it is anticipated that most or probably all will be published. A listing of titles, authors, dates and journal publication status is given in a subsequent section. The technical aspects of each of these reports has been given in each of the six semi annual Progress Reports and so according to instructions given in "Reporting Procedures" this is not repeated.

The Principal Investigator for the project was Professor Herbert Solomon. However, while he was on a two year leave to serve as Chief Scientist for the Office of Naval Research in London, Professor Bradley Efron served as Acting Principal Investigator. Other scientific personnel who served on the project are listed below. Of this group Andrew F. Siegel received his Ph.D.; the others were all Postdoctoral.

Scientific Personnel

Mark Brown
Peter Cooke
Bradley Efron
Alan Gelfand
Albert John Petkau
Leon Pesotchinsky
Nozer Singpurwalla
Herbert Solomon
J. Michael Steele
Michael A. Stephens
Howard Weiner

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One feature of this project was an ability to respond to Army problems. In this connection work was undertaken with

Army Procurement Research Office
Fort Lee, Virginia
(Quality improvement system)

Walter Reed Institute of Research
(Randomization schemes)

Army Operational Test and Evaluation Agency
(Reliability of tank performance)

For other situations, one day meetings sufficed. In addition papers were presented at the Annual Design of Experiments Conferences sponsored by the Army Research Office.

INTERIM TECHNICAL REPORTS AND
JOURNAL PUBLICATION STATUS

1977-1979

Estimation of parameters of zero-one processes by interval sampling:
An adaptive strategy, M. Brown, H. Solomon, & M.A. Stephens.
Technical Report No. 1, 2/28/77.
Journal of Operations Research Society, 25, 1977, 493-505.

Limit probabilities in a multi-type critical age-dependent branching
process, Howard Weiner.
Technical Report No. 2, 3/7/77.
Journal of Non Linear Analysis, 3, No. 2, 1978, 229-238.

Management strategies in fixed-structure models of complex organizations,
Crayton Walker & Alan Gelfand.
Technical Report No. 3, 3/14/77.
Behavioral Science, 24, No. 2, 1979, 112-121.

Random space filling and moments of coverage in geometrical probability,
Andrew F. Siegel.
Technical Report No. 4, 4/4/77.
Journal of Applied Probability, 15, 1978, 340-335.

Distribution of a sum of weighted chi-square variables, Herbert Solomon
& M.A. Stephens.
Technical Report No. 5, 6/2/77.
Journal of the American Statistical Association, 72, 1977, 881-885.

A study of renewal processes with IMRL and DFR interarrival times,
Mark Brown.
Technical Report No. 6, 6/7/77.
Annals of Probability, 1980.

Goodness-of-fit for the extreme value distribution, M.A. Stephens.
Technical Report No. 7, 7/18/77.
Biometrika, 64, 1977, 583-588.

Random arcs on the circle, Andrew F. Siegel.
Technical Report No. 8, 7/26/77.
Journal of Applied Probability, 15, 1978, 774-789.

Information analysis of linear interactions in contingency tables,
S. Kullback & D.V. Gokhale
Technical Report No. 9, 8/15/77.
Communications in Statistics, 7, Series A, No. 1, 1978, 27-46.

Management strategies in fixed-structure models of complex organiza-
tions II, Alan Gelfand & Crayton Walker.
Technical Report No. 10, 9/2/77.
Submitted to Behavioral Science

Joint distributions for total progeny in a critical branching process,
Howard Weiner.
Technical Report No. 11, 9/23/77.
Scandi Acturial Journal, 1978, 211-224.

On the distribution of the greatest common divisor, Persi Diaconis
& Paul Erdos.
Technical Report No. 12, 10/10/77.
Submitted to Acta Arithmetica.

Approximate solutions for certain optimal stopping problems,
Albert John Petkau.
Technical Report No. 13, 1/15/78.
JASA, 1980.

The covariance matrix of normal order statistics, M.A. Stephens &
C.S. Davis.
Technical Report No. 14, 2/21/78.
Communications in Statistics, 6, No. 1, 1977, 75-81.

Φ -optimal second order designs for symmetric regions, Leon Pesotchinsky.
Technical Report No. 15, 2/28/78.
Journal of Statistical Planning and Inference, 2, 1978, 173-188.

Remarks on BIB designs with repeated blocks, Leon Pesotchinsky.
Technical Report No. 16, 4/3/78.
Submitted to Journal of Statistical Planning and Inference

Asymptotic coverage distribution on the circle, Andrew F. Siegel.
Technical Report No. 17, 4/3/78.
Annals of Probability, August 1979, 651-661.

The extinction propability in a critical branching process, Howard Weiner.
Technical Report No. 18, 5/30/78.
Sankhya, Series A, 40, Part 1, 1978, 52-60.

Testing for periodicity in a time series, Andrew F. Siegel,
Technical Report No. 19, 6/5/78.
Submitted to Journal of the American Statistical Association.

On the half-sample method for goodness of fit, Michael A. Stephens.
Technical Report No. 20, 7/12/78.
Journal of the Royal Statistical Society, Series B, 40, 1978, 64,70.

Toward characterizing Boolean transformations, Alan Gelfand,
Technical Report No. 21, 8/23/78.
Proceedings of Conference of Society for General Systems
Research, 1977, 111-116.

Goodness-of-fit tests with special reference to tests for exponentiality,
Michael A. Stephens.
Technical Report No. 22, 9/18/78.
Submitted to Canadian Journal of Statistics.

Hammersley's law for the van der Corput sequence: An instance of probability
theory for pseudo-random numbers, A. del Junco & J. Michael Steele.
Technical Report No. 23, 10/9/78.
Annals of Probability, 7, No. 2, 1979, 267-275.

Approximations to densities of geometrical probability, Herbert Solomon
& M.A. Stephens.
Technical Report No. 24, 10/27/78.
Journal of Applied Probability, March 1980.

Sequential random parking in the plane, Howard Weiner.
Technical Report No. 25, 11/5/78.
Journal of Applied Probability, 15, 1978, 803-814.

A new approach to inference from accelerated life tests, Frank Proshan & N.D. Singpurwalla.

Technical Report No. 26, 12/4/78.
IEEE Transactions in Reliability, 1980.

Limit probabilities for critical age dependent branching processes with immigration, Howard Weiner.

Technical Report No. 27, 1/15/79.
Journal of Non Linear Analysis, 3, No. 2, 229-238.

On testing the equality of two proportions, David Berengut & John Petkau.

Technical Report No. 28, 2/8/79.
Submitted to Biometrika.

Bayes and equivariant estimators of the variance of a finite population, Herbert Solomon & S. Zacks.

Technical Report No. 29, 2/21/79.
Submitted to Communication in Statistics.

On an optimal stopping problem of Gusein-Zake, A.Q. Frank & S. Samuels.

Technical Report No. 30, 3/5/79.
Journal of Stochastic Processes, 1980.

A martingale inequality for the square and maximal functions,

Louis H.Y. Chen,
Technical Report No. 31, 3/15/79.
Annals of Probability, 1980.

Statistical inference for bounds of random variables, Peter Cooke.

Technical Report No. 32, 4/3/79.
Biometrika, 1980.

Statistics as a mathematical discipline, D.V. Lindley.

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Journal of the New Zealand Statistical Society, June 1979, Vol. 14
No. 2.

Catching small sets under flows, Martin H. Ellis & J. Michael Steele.

Technical Report No. 34, 5/2/79.
Annals of the Institute Henri Poincare, Vol. XV, No. 1, 1979, 33-40.

Variance reduction in Monte Carlo simulation, Mark Brown, Herbert Solomon,
& Michael A. Stephens.

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Journal of Applied Probability, 1980.

EDF tests of fit for the logistic distribution, Michael A. Stephens.

Technical Report No. 36, 9/5/79.

Biometrika, 66, 1979, 591-596.

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Stephen M. Samuels.

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JASA, 1980.

The Anderson-Darling Statistic, Michael A. Stephens.

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Encyclopedia of Statistical Sciences, 1980.

Optimal whereabouts search for a moving target, Joseph B. Kadane &
Lawrence Stone.

Technical Report No. 40, 11/15/79.

Submitted to Operations Research.

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Howard Weiner.

Technical Report No. 41, 12/14/79.

Sankhya Series A, 1980.